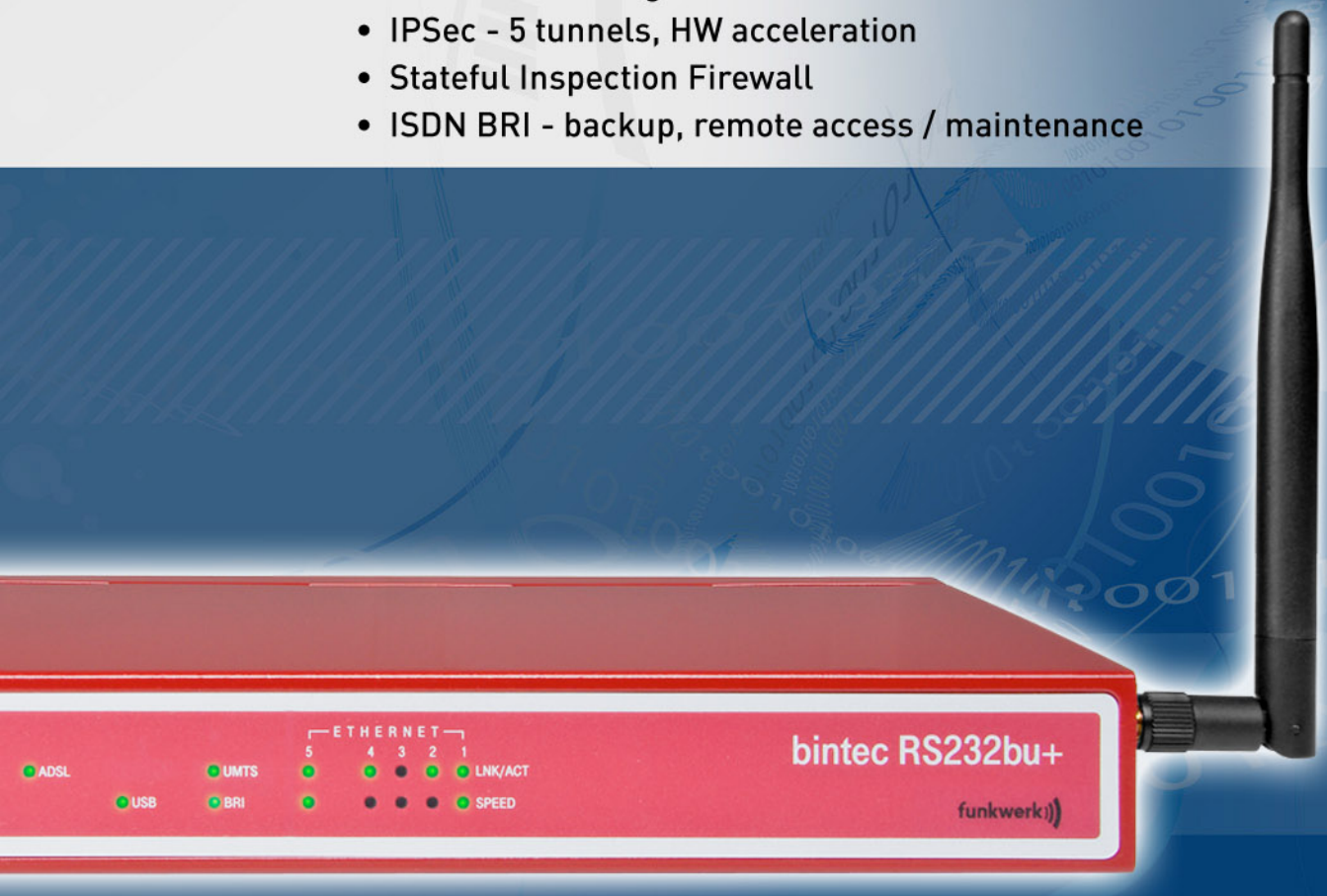
funkwerk
enterprise communications

IP ACCESS ROUTER

The universal router with ADSL 2+, ISDN and UMTS (HSPA+)

bintec RS232bu+

- UMTS (3.5G; HSPA+) modem
- ADSL 2+ modem - ADSL over ISDN
- 5 x Gigabit Ethernet
- Web-based configuration / wizards
- IPSec - 5 tunnels, HW acceleration
- Stateful Inspection Firewall
- ISDN BRI - backup, remote access / maintenance



Universal Gateway with integrated ADSL 2+ modem, ISDN and UMTS (HSPA+, 3.5G) Modem

RS232bu+

The bintec RS232bu+ is a powerful and, thanks to its comprehensive equipment, flexible router. The integrated UMTS modem supports the HSPA+ (3.5G) standard with a maximum download rate of 21.1 Mbit/s and a maximum upload rate of 5.76 Mbit/s.
In addition, the device has an integrated ADSL 2+ modem which supports Annex B (ADSL over ISDN), which is predominantly used in Germany, in accordance with ITU G992.1 and is compatible with Deutsche Telekom's U-R2 connection.
The gateway in the fan-free metal housing guarantees long-term reliability in critical corporate applications and is ideal for use as an access router in SMEs, branch offices and home offices. In addition to the integrated ADSL 2+ modem, the device has five Gigabit Ethernet ports, which can be configured for LAN, WAN or DMZ, and comes with a licence for five hardware-accelerated IPSec tunnels. The built-in ISDN BRI interface can be used as a remote configuration access and as an ISDN backup interface.
Thanks to the variety of different connection technologies used, the RS232bu+ sets new standards for the flexibility of access routers. By using an external indoor or outdoor UMTS antenna it is possible to significantly improve reception.

Using functions flexibly

Only a few functions are required to forward data packets between two networks. The bintec RS232bu+ has features that go far beyond just routing and allow it to be integrated into complex IT infrastructures. By using Extended Routing and NAT (ERN) the data can be routed in IP routing according to criteria such as IP protocols (Layer 4), source or destination IP address, source or destination port, TOS/DSCP, source or destination interface and the status of the destination interface. In addition, you can also use network address translation to translate the data traffic for both inbound and outbound connections and individually for each interface based on a wide range of criteria.
The comprehensive multicast support makes the device ideal for use in multimedia and streaming applications.
The Stateful Inspection Firewall (SIF) offers effective protection against attacks from the Internet through dynamic packet filtering. Firewall handling is made easier through numerous pre-configured services. An optional content filter rounds off the security functions of the devices*. In this case, all the outgoing Internet enquiries are classified and allow contents not wanted to be reliably filtered out.
The basic equipment of the RS Series also offers a SIP application level gateway (ALG) for the direct connection of IP telephones in the network or for registering with a VoIP provider, without affecting the security of the WAN connection. The corresponding releases in NAT and the internal Stateful Inspection Firewall are controlled automatically by ALG for the length of the communication.
Quality of Service is more than a watchword in FEC devices. Thanks to the rising convergence between voice and data, the classification of data streams is gaining in importance. Our gateways provide corresponding QoS mechanisms for prioritising the VoIP traffic ahead of normal internet traffic, for example, and to guarantee it sufficient bandwidth. Alternatively you can give normal data traffic priority over e-mail traffic. The bintec QoS implementation allows voice data to be processed before e-mal data, for example, within a VPN tunnel.
The DNS proxy function supports the LAN for address implementation and the automated IP configuration of PCs is carried out over an integrated DHCP server.
Remote CAPI is available for the joint use of various ISDN services.

Comprehensive IPSec implementation

The IPSec implementation integrated in bintec RS232bu+ works not only with preshared keys but also with certificates. This allows a public key infrastructure to be created for maximum security. (The German Federal Office for Information Security also recommends the use of certificates.)
Furthermore, the bintec IPSec implementation offers support when creating VPN connections with dynamic IP addresses: Even small branch offices can be reached without having to be permanently online. If both VPN nodes only have dynamic IP addresses, confidential information can continue. The exchange of IP addresses is carried out either over dynamic DNS providers or directly over ISDN. The actual dynamic IP address is transferred either in the ISDN D-channel (free of charge) or, if this is not possible, in the ISDN B-channel (at cost).

Load Balancing/Backup

The devices offer a unique level of flexibility thanks to the wide variety of interfaces supported. The bintec RS232bu+ supports the ability to configure two interfaces as WAN interfaces. As a result, there is not only more bandwidth available, but there is the opportunity to spread data traffic across individual WAN connections according to load or data type. Equally, you can use a connection (e.g. UMTS) for the VPN connection to the head office and use a second WAN port for a low-cost ADSL connection to guarantee the company's other data traffic. If either connection fails, the other can take over the entire data transfer.

Simple configuration and maintenance

The router is configured over the Funkwerk Configuration Interface (FCI), using the integrated configuration wizards for example. The FCI is a web-based graphic user surface that you can use from any PC with an up-to-date Web browser via an HTTP or encrypted HTTPS connection. It also offers the opportunity to manage the devices locally and remotely over other configuration accesses such as Telnet, SSH, ISDN Login and GSM dialin.

DIME Manager from Funkwerk Enterprise Communications (FEC) is a free tool for managing FEC devices.
Dime Manager is aimed at administrators who manage networks with up to 50 devices. The software simplifies the management and configuration of gateways or access points either individually or in logical groups.
When developing DIME Manager, simple and efficient operation was the primary aim. It allows, for example, software updates or configurations to be applied to individual devices or groups of devices simply by drag and drop. DIME Manager recognises and manages new devices in the network using SNMP multicasts, in other words independent of their current IP address.

* Content filtering is a fee-paying service and is available as a 30-day trial version.

GSM / UMTS

Feature	Description
Supported standards	Support of UMTS (3.5G/HSPA+), (download rate up to 21.1 Mbps, upload rate up to to 5.76), GPRS, Edge and GSM
UMTS (3.5G) / WCDMS bands	850/900/1900/2100 MHz

DSL Interface

Feature	Description
ADSL	ADSL over ISDN (ITU G.992.1 Annex B, ISDN - compatible to U-R2 connection of Deutsche Telekom, G.Lite (ITU G.922.2)
ADSL 2 / ADSL 2+	ADSL over ISDN (ITU G.992.3, ITU G.992.5 Annex B)
ADSL	Support of Dying Gasp
ATM	Support of layer 1 protocol AAL5, PVCs, RFC 1483
ATM	Support of up to 7 virtual channels (VC)
ATM	Support of OAM F4/F5 line monitoring
ATM	Support of ATM traffic management (COS - CBR, VBR, UBR)

ISDN Interface

Feature	Description
CAPI	CAPI 2.0 with CAPI user concept (password for CAPI use)
ISDN protocols	Euro-ISDN (Point-to-mulitpoint/Point-to-point), 1TR6 and other national ISDN protocols
ISDN auto-configuration	Automatic recognition and configuration of ISDN protocols
ISDN leased lines	Supported leased lines: D64S, D64S2, TS02, D64S2Y
B channel protocols	Excellent interoperability with other manufacturers (Raw HDLC, CISCO HDLC, X.75)
X.31 over CAPI	Support for various connection paths: X.31/A for ISDN D-channel, X.31/A+B for ISDN B-channel, X.25 within ISDN B-channel (also leased lines)
Bit rate adaption	V.110 (1,200 up to 38,400 bps), V.120 up to 57,600 kbps (HSCSD) for connection to GSM subscribers

VPN

Feature	Description
PPTP (PAC/PNS)	Point to Point Tunneling Protocol for establishing fo Virtual Privat Networks, inclusive strong encryption methods with 128 Bit (MPPE) up to 168 Bit (DES/3DES, Blowfish)
GRE v.0	Generic Routing Encapsulation V.0 according RFC 2784 for common encapsulation
L2TP	Layer 2 tunnelling protocol inclusive PPP user authentication
Number of VPN tunnels	Inclusive 5 active VPN tunnels with the protocols IPSec, PPTP, L2TP and GRE v.0 (also in combination possible)
IPSec	Internet Protocol Security establishing of VPN connections
Number of IPSec tunnels	Inclusive 5 active IPSec tunnels
IPSec Algorithms	DES (64 Bit), 3DES (192 Bit), AES (128,192,256 Bit), CAST (128 Bit), Blowfish (128-448 Bit), Twofish (256 Bit); MD-5, SHA-1, RipeMD160, Tiger192 Hashes
IPSec hardware acceleration	Integrated hardware acceleration for IPSec encryption algorithms DES, 3DES, AES
IPSec IKE	IPSec key exchange via preshared keys or certificates
IPSec IKE Config Mode	IKE Config Mode server enables dynamic assignment of IP addresses from the address pool of the company. IKE Config Mode client enables the router, to get assigned dynamically an IP address.
IPSec IKE XAUTH (Client/Server)	Internet Key Exchange protocol Extended Authenticaion client for login to XAUTH server and XAUTH server for loging of XAUTH clients
IPSec IKE XAUTH (Client/Server)	Inclusive the forwarding to a RADIUS-OTP (One Time Password) server (supported OTP solutions see www.funkwerk-ec.com).
IPSec NAT-T	Support of NAT-Traversal (Nat-T) for the application at VPN lines with NAT
IPSec IPComp	IPSec IPComp data compression for higher data throughput via LZS
IPSec certificates (PKI)	Support of X.509 multi-level certificates compatible to Micrososft and Open SSL CA server; upload of PKCS#7/8/10/12 files via TFTP, HTTP, HTTP, LDAP, file upload and manual via FCI
IPSec SCEP	Certificates management via SCEP (Simple Certificate Enrollment Protocol)
IPSec Certificate Revocation Lists	Support of remote CRLs on a server via LDAP or local CRLs
IPSec Dead Peer Detection (DPD)	Continuous control of IPSec connection
IPSec dynamic IP via ISDN	Transmission of dynamic IP address in ISDN D or B channel; free-of-charge licence necessary
IPSec dynamic DNS	Enables the registering of dynamic IP addresses by a dynamic DNS provider for establishing a IPSec connection.
IPSec RADIUS	Authentication of IPSec connections at a RADIUS server. Additionally the IPSec peers, which were configured on a RADIUS server, can be loaded into the gateway (RADIUS dialout).
IPSec Multi User	Enables the Dial-in of several IPSec clients via a single IPSec peer configuration entry
IPSec QoS	The possibility to operate Quality of Service (traffic shaping) inside of an IPSec tunnel
IPSec NAT	By activating of NAT on an IPSec connection it is possible, to implement several remote locations with identical local IP addess networks in different IP nets for the VPN connection
IPSec throughput (1400)	34 Mbps with 1400 Byte packets with AES 256 / AES 128 / 3 DES encryption
IPSec throughput (256)	11 Mbps with 256 Byte packets with AES 256 / AES 128 / 3 DES encryption

Security

Feature	Description
NAT/PAT	Symmetric Network and Port Address Translation (NAT/PAT) with randomly generated ports inclusive Multi NAT (1:1 translation of whole networks)
Policy based NAT/PAT	Network and Port Address Translation via different criteria like IP protocols, source/destination IP Address, source/destination port
Policy based NAT/PAT	For incoming and outgoing connections and for each interface variable configurable
Content Filtering	Optional ISS/Cobion Content filter (30 day test license inclusive)
Stateful Inspection Firewall	Packet filtering depending on the direction with controling and interpretation of each single connection status
Packet Filter	Filtering of IP packets according to different criteria like IP protocols, source/destination IP address, source/destination port, TOS/DSCP, layer 2 priority for each interface variable configurable

Routing

Feature	Description
Policy based Routing	Extended routing (Policy Based Routing) depending of diffent criteria like IP protocols (Layer4), source/destination IP address, source/destination port, TOS/DSCP, source/destination interface and destination interface status
Multicast IGMP	Support of Internet Group Management Protocol (IGMP v1, v2, v3) for the simultaneous distribution of IP packets to several stations
Multicast IGMP Proxy	For easy forwarding of multicast packets via dedicated interfaces
Multicast inside IPSec tunnel	Enables the transmission of multicast packets via an IPSec tunnel
RIP	Support of RIPv1 and RIPv2, separated configurable for each interface
Extended RIP	Triggerd RIP updates according RFC 2091 and 2453, Poisened Rerverse for a better distribution of the routes; furthermore the possibility to define RIP filters for each interface.
Routing throughput (1518)	199 Mbps with 1518 Byte packets
Routing throughput (256)	198 Mbps with 256 Byte packets

Protocols / Encapsulations

Feature	Description
PPP/MLPPP	Support of Point to Point Protocol (PPP) for establishing of standard PPP connections, inclusive the Multilink extension MLPPP for the bundeling of several connections
PPPoE (Server/Client)	Point-to-Point Protocol over Ethernet (Client and Server) for establisching of PPP connections via Ethernet/DSL (RFC 2516)
MLPPPoE (Server/Client)	Multilink extension MLPPPoE for bundeling several PPPoE connections (only if both sides support MLPPPoE)
PPPoA	Point to Point Protocol over ATM for establishing of PPP connections via ATM/DSL
IPoA	Enables the easy routing of IP via ATM
DNS	DNS client, DNS server, DNS relay and DNS proxy
DYN DNS	Enables the registering of dynamic assigned IP addresses at adynamic DNS provider, e.g. for establishing of VPN connections
DNS Forwarding	Enables the forwarding of DNS requests of free configurable domains to assigned DNS server.
DHCP	DHCP Client, Server, Proxy and Relay for siplified TCP/IP configuration
Packet size controling	Adaption of PMTU or automatic packet size controling via fragmentation

QoS

Feature	Description
Policy based Traffic Shapping	Dynamic bandwidth management via IP traffic shaping
Bandwidth reservation	Dynamic reservation of bandwidth, allocation of guaranteed and maximum bandwidths
DiffServ	Priority Queuing of packets on the basis of the DiffServ/TOS field
Layer2/3 tagging	Conversion of 802.1p layer 2 priorisation information to layer 3 diffserv attributes
TCP Download Rate Control	For reservation of bandwidth for VoIP connections

Redundancy / Loadbalancing

Feature	Description
BRRP	Optional: Bintec Router Redundancy Protocol for backup of several passive or active devices with free selectable priority
BoD	Bandwidth on Demand: dynamic bandwidth to suit data traffic load
Load Balancing	Static and dynamic load balancing to several WAN connections on IP layer
VPN backup	Simple VPN backup via different media. Additional enables the Funkwerk interface based VPN concept the application of routing protocols for VPN connections.

Layer 2 Functionality

Feature	Description
Bridging	Support of layer 2 bridging with the possibility of separation of network segment via the configuration of bridge groups
VLAN	Support of up to 32 VLAN (Virtual LAN) for segmentation of the network in independent virtual segments (workgroups)
Proxy ARP	Enables the router to answer ARP requests for hosts, which are accessible via the router. That enables the remote clients to use an IP address from the local net.

Logging / Monitoring / Reporting

Feature	Description
Internal system logging	Syslog storage in RAM, display via web-based configuration user interface (http/https), filter for subsystem, level, message
External system logging	Syslog, several syslog server with different syslog level configurable
E-Mail alert	Automatic E-Mail alert by definable events
SNMP traps	SNMP traps (v1, v2, v3) configurable
Activity Monitor	Sending of information to a PC on which Brickware is installed
IPSec monitoring	Display of IPSec tunnel and IPSec statistic; output via web-based configuration user interface (http/https)
Interfaces monitoring	Statistic information of all pysical and logical interfaces (ETH0, ETH1, SSIDx, ...), output via web-based configuration user interface (http/https)
ISDN monitoring	Display of active and past ISDN connections; output via web-based configuration user interface (http/https)
IP accounting	Detailed IP accounting, source, destination, port, interface and packet/bytes counter, transmission also via syslog protocol to syslog server
ISDN accounting	Detailed ongoing recording of ISDN connection parameter like calling number and charging information, transmission also via syslog protocol to syslog server
RADIUS accounting	RADIUS accounting for PPP, PPTP, PPPoE and ISDN dialup connections
Keep Alive Monitoring	Control of hosts/connections via ICMP polling
Tracing	Detailed traces can be done for different protocols e.g. ISDN, PPPoE, ... generation local on the device and remote via DIME manager
Tracing	Traces can be stored in PCAP format, so that import to different open source trace tools (e.g. wireshark) is possible.

Administration / Management

Feature	Description
RADIUS	Central check of access authorization at one or several RADIUS server, RADIUS (PPP, IPSec inclusive X-Auth and login authentication)
RADIUS dialout	On a RADIUS server configured PPP und IPSec connection can be loaded into the gateway (RADIUS dialout).
TACACS+	Support of TACACS+ server for login authentication and for shell comando authorization
Time synchronization	The device system time can be obtained via ISDN and from a SNTP server (up to 3 time server configurable). The obtained time can also be transmitted per SNTP to SNTP clients.
Automatic Time Settings	Time zone profiles are configurable. That enables an automatic change from summer to winter time.
Supported management systems	DIME Manager, XAdmin
Configurable scheduler	Configuring of time and event controlled tasks, e.g. reboot device, activate/deactivate interface, activate/deactivate WLAN, trigger SW update and configuration backup
Funkwerk Configuration Interface (FCI)	Integrated web server for web-based configuration via HTTP or HTTPS (supporting self created certificates). This user interface is by most of Funkwerk EC products identical.
Software update	Software updates are free of charge; update via local files, HTTP, TFTP or via direct access to the FEC web server
Remote maintenance	Remote maintenance via telnet, SSL, SSH, HTTP, HTTPS and SNMP (V1,V2,V3)
Configuration via serial interface	Serial configuariton interface is available
ISDN remote maintenance	Remote maintenance via ISDN dial-in with checking of the calling number. The ISDN remote maintenance connection between two funkwerk devices can be encrypted.
ISDN remote maintenance	A transparent mode enables transmissions of configurations and software updates respectively
GSM remote maintenance	Remote maintenance via GSM login (external USB UMTS (3G) modem required)
Device discovery function	Device discovery via SNMP multicast.
On The Fly configuration	No reboot after reconfiguration required
SNMP	SNMP (v1, v2, v3), USM model, VACM views, SNMP traps (v1, v2, v3) configurable, SNMP IP access list configurable
SNMP configuration	Complete management with MIB-II, MIB 802.11, Enterprise MIB
Configuration export and import	Load and save configurations, optional encrypted; optional automatic control via scheduler
SSH login	Supports SSH V1.5 and SSH V2.0 for secure connections of terminal applications
HP OpenView	Integration into Network Node Manager
XAdmin	Support of XAdmin roll out and configuration managemant tool for larger router installations (IP+ISDN+GSM)

Interfaces

Feature	Description
Ethernet	5 x 10/100/1000 Mbps Ethernet Twisted Pair, autosensing, Auto MDI/MDI-X, up to 4 ports can be switches as additional WAN ports incl. load balancing, all Ethernet ports can be configured as LAN or WAN.
USB 2.0 host	USB 2.0 full speed host port for connecting UMTS (3G) USB modem sticks (supported sticks: see www.funkwerk-ec.com)
Serial console	Serial console interface / COM port (mini USB)
ADSL/ADSL 2+	ADSL over ISDN (compatible to U-R2 connection of Deutsche Telekom)
ISDN Basic Rate (BRI)	1 x BRI (TE), 2 B channels
GSM/UMTS (3.5G)	UMTS (3G), HSPA+ (3.5G), GPRS, Edge or GSM with intergrated GSM/UMTS (3.5G) modem
External UMTS antenna connectors	Two SMA antenna connectors for external UMTS antennas

Hardware Features

Feature	Description
Realtime clock	System time persists even at power failure for some hours.
Wall mounting	Integrated in housing
Environment	Temperature range: Operational 0°C to 40°C; storage -10°C to 70°C; Max. rel. humidity 10 - 95% (non condensing)
Power supply	External wall power supply 110-240V / 12 V DC, 1.5 A, with energy efficient switching controler; complies with EuP directive 2008/28/EC
Power consumption	Less than 5 Watt
Housing	Metal case, opening for Kensington lock, connectors at back side, prepared for wall mounting
Dimension	Ca. 235 mm x 31.5 mm x 146,5 mm (W x H x D)
Weight	Ca. 1100g
Fan	Fanless design therefor high MTBF
Reset button	Restart or reset to factory state possible
Status LEDs	Power, Status, 10 * Ethernet, ADSL, ISDN, WLAN, USB
Standards and certifications	R&TTE Directive 1999/5/EG; EN 55022; EN 55024 + EN 55024/A1; EN61000-3-2; EN 61000-3-3; EN 61000-4-4; EN 60950-1; EN 300 328; EN 301 489-7; EN 301 489-24; EN 301 908-1; EN 301 908-2; EN 301 511

Content of Delivery

Feature	Description
Manual	Quick Installation Guide in German and English
DVD	DVD with system software, management software and documentation
Ethernet cable	1 Ethernet cable, 3m
Power supply	Wall power supply 110-240V / 12 V DC, 1.5 A, with high efficient switching controler
ADSL cable	ADSL cable (RJ11-RJ45), 3m
ISDN (BRI/S0) cable	ISDN (BRI/S0) cable, 3m
UMTS (3G) antenna	Two external 2 dBi dipol quadband antennas

Service

Feature	Description
Warranty	2 year manufacturer warranty inclusive advanced replacement
Software Update	Free-of-charge software updates for system software (BOSS) and management software (DIME manager)

Article number

Feature	Description
bintec RS232bu+; art. no. 5510000293	IP Access Router; incl. ADSL modem (Annex B, ISDN); UMTS (3.5G/HSPA+); 1x ISDN BRI; incl. IPSec (5 tunnels), certificates, HW encryption; 4+1 Gigabit Eth. switch; USB port; german and intern. version.

Options

Feature	Description
Antenna	ANT-Omni-3G-UMTS: Omni-directional multi-band GSM-3G (UMTS) antenna incl. mounting kit and 5 m cable for outdoor usage, SMA connector for RS120wu, RS230au+, RS232bu+; art.no. 5500000853
Amplifier	Funkwerk Home Compenser®; GSM/GPRS/EDGE/UMTS/HSCSD/HSDPA/HSUPA send and receive signal booster, inclusive antenna and 7m cable, SMA connector for RS120wu, RS230au+, RS232bu+; art.no. 5500000852
Amplifier	Funkwerk active UMTS (3G) antenna for UMTS (3G) USB Sticks, UMTS band 1 active antenna, 7db, 15m cable; art.no. 5500001017
HotSpotHosting	Art.no. 5510000198 - HotSpot solution hosting fee for 1 year and 1 location; art.no. 5500000861 - HotSpot solution hosting fee for 2 year and 1 location; art.no. 5510000199 - Additional location for HotSpot solution
Cobion Content Filter Small	License for one year Cobion content filter (small); art. no. 80551
IP address ISDN B/D channel license	Free of charge license for IP address transmission in ISDN D or B channel for IPSec connections; registering under www.funkwerk-ec.com required.
BRRP	License for BRRP feature set; art. no. 5500001023
Service package 'medium' (art.no. 5500000812)	Warranty extension of 3 years to a total of 5 years, including advanced replacement for FEC products of the category "medium". (Please find a) detailed description as well as an overview of the categories on www.funkwerk-ec.com/servicepackages.